Memory judgments

Psychology 248

Prof. Benjamin

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risotto
anion
blunts
twill
plumbed
ballade
nohow
lulls
carob
sloshed
carload
nodules
ferried

curio
swanky
gusty
grandly
acceded
hearers
antonym
masher
endive
trinket
hawing
bigness
sea's

hooting
biped
brassy
arigato
camphor
eugenic
milady
leafed
dusts
wrinkly
petunia
portico
doting

eggnog
cropper
flapped
furrows
fleet's
miff
soiree
satiate
florid
veiling
denting
encase
leered

exuded
jocular
tousled
speared
slugged
sops
splay
hampers

Yes/no recognition

- brocade?
- eggnog?
- risotto?
- gratify?
- eardrum?
- glinted?

Recognition experiments

	“YES”	“NO”
Studied word	HIT (Hit rate: HR)	MISS (Miss rate: 1- HR)
Unstudied word	FALSE ALARM (False alarm rate: FAR)	CORRECT REJECTION (Correct rejection rate: 1-FAR)

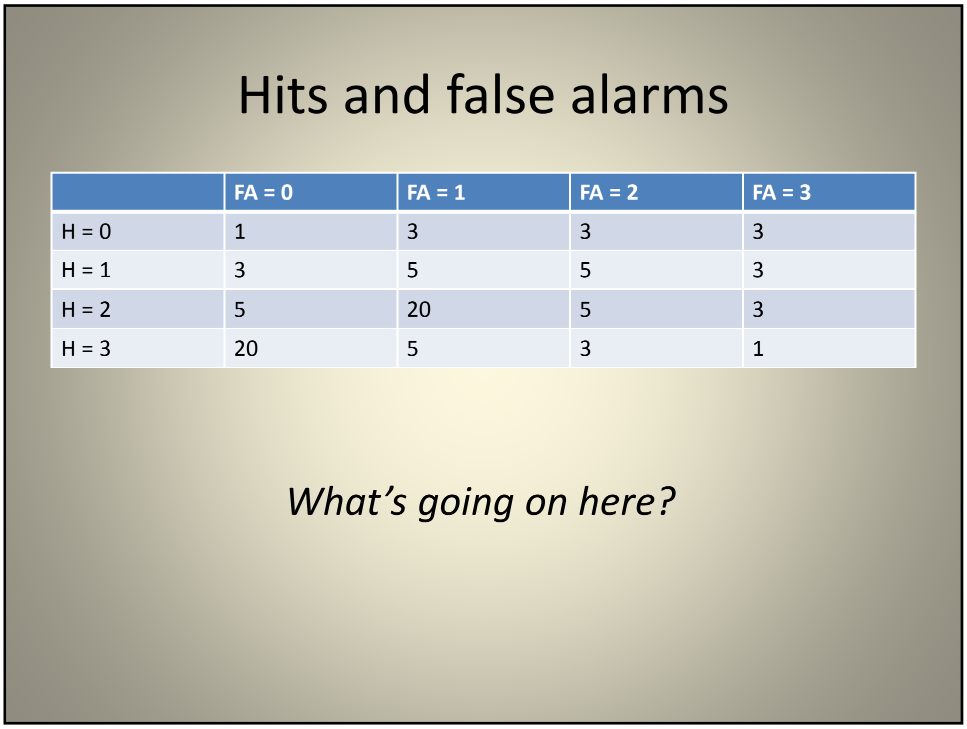
Hits and false alarms

	FA = 0	FA = 1	FA = 2	FA = 3
H = 0				
H = 1				
H = 2				
H = 3				

Hits and false alarms

	FA = 0	FA = 1	FA = 2	FA = 3
H = 0	20	5	3	1
H = 1	5	20	5	3
H = 2	3	5	20	5
H = 3	1	3	5	20

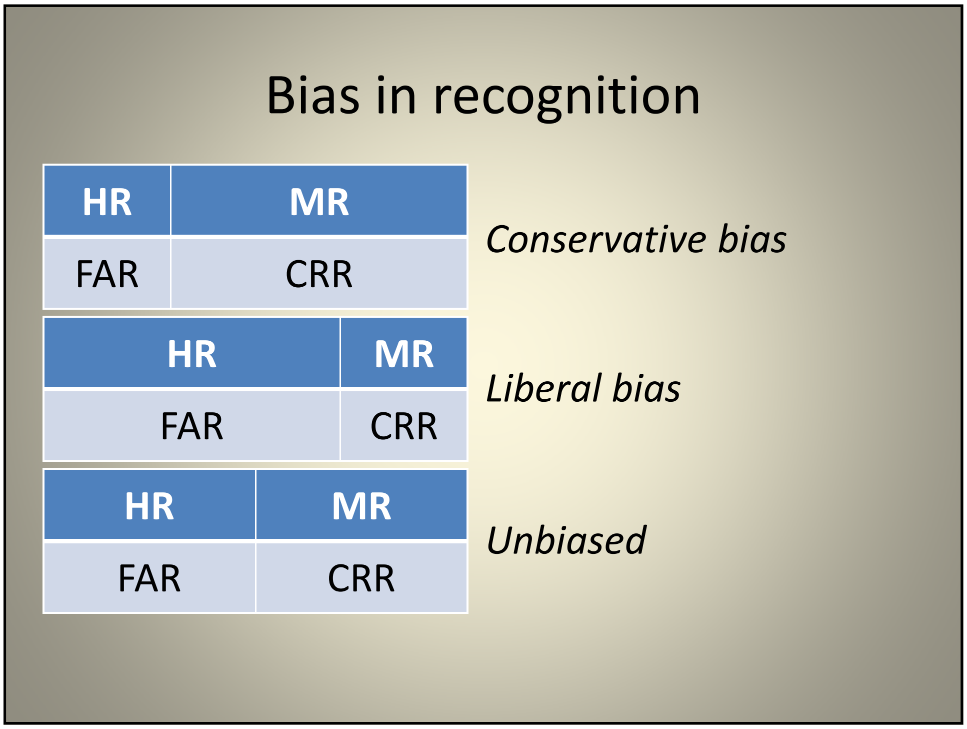
What’s going on here?



Hits and false alarms

	FA = 0	FA = 1	FA = 2	FA = 3
H = 0	1	3	3	3
H = 1	3	5	5	3
H = 2	5	20	5	3
H = 3	20	5	3	1

What's going on here?



Bias in recognition

HR	**MR**
FAR	CRR

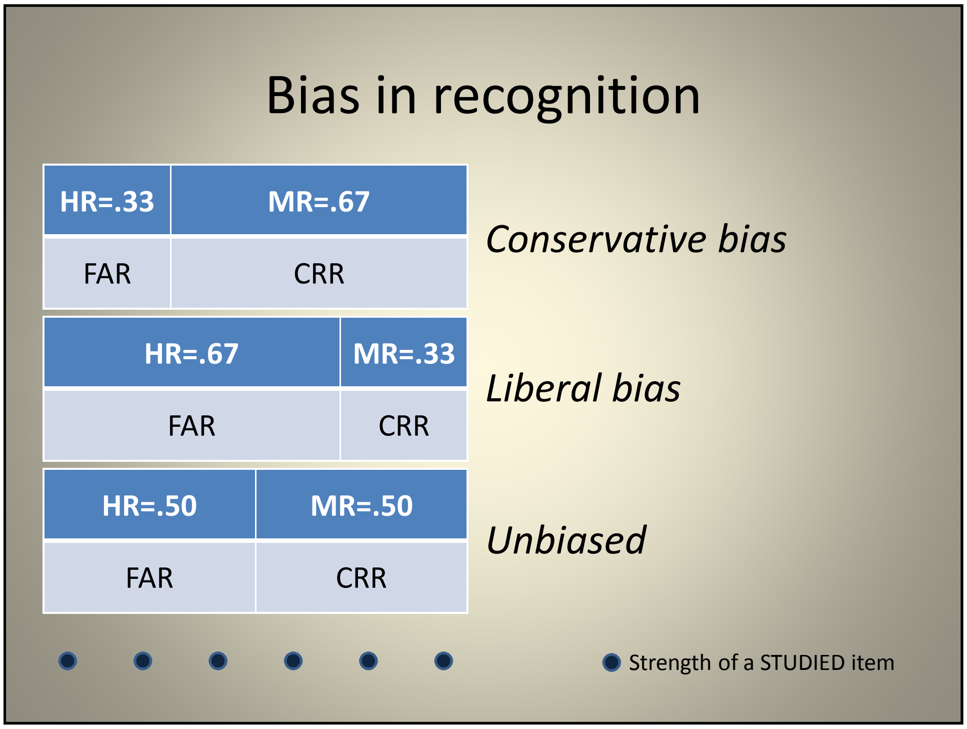
Conservative bias

HR	**MR**
FAR	CRR

Liberal bias

HR	**MR**
FAR	CRR

Unbiased



Bias in recognition

HR=.33	**MR=.67**
FAR	CRR

Conservative bias

HR=.67	**MR=.33**
FAR	CRR

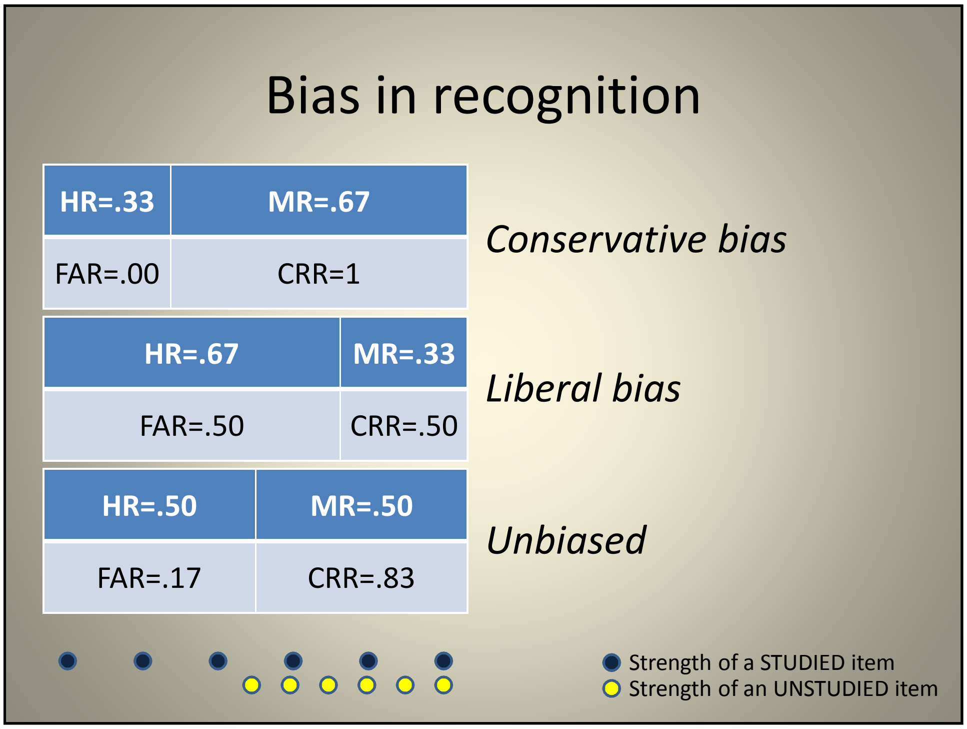
Liberal bias

HR=.50	**MR=.50**
FAR	CRR

Unbiased

● ● ● ● ● ●

● Strength of a STUDIED item



Bias in recognition

HR=.33	**MR=.67**
FAR=.00	CRR=1

Conservative bias

HR=.67	**MR=.33**
FAR=.50	CRR=.50

Liberal bias

HR=.50	**MR=.50**
FAR=.17	CRR=.83

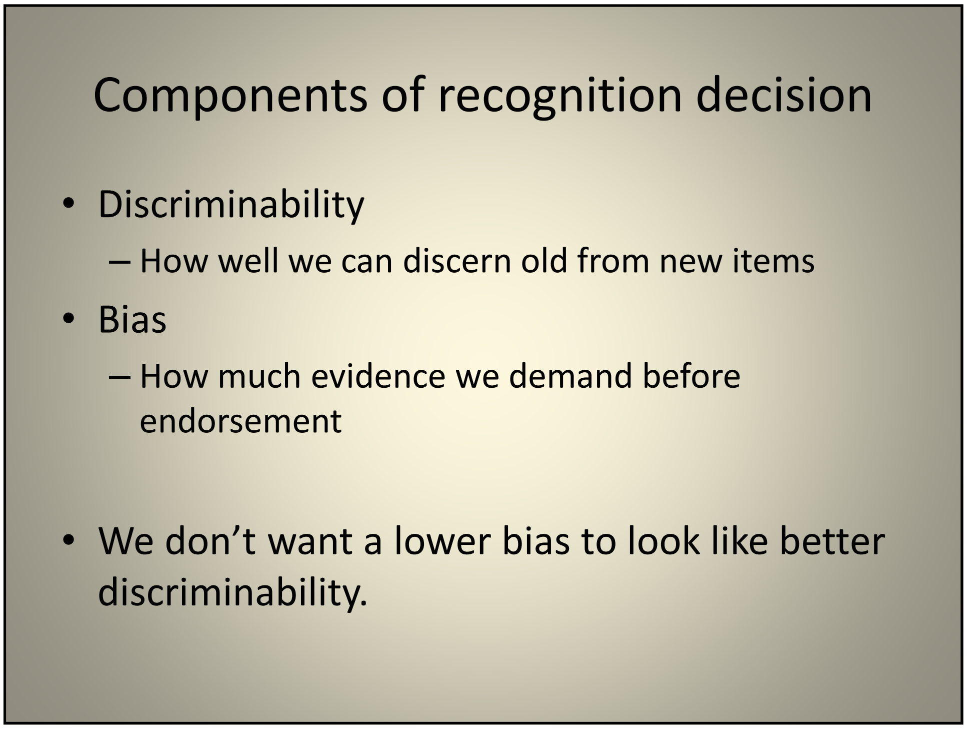
Unbiased

● ● ● ● ● ●

○ ○ ○ ○ ○ ○

● Strength of a STUDIED item

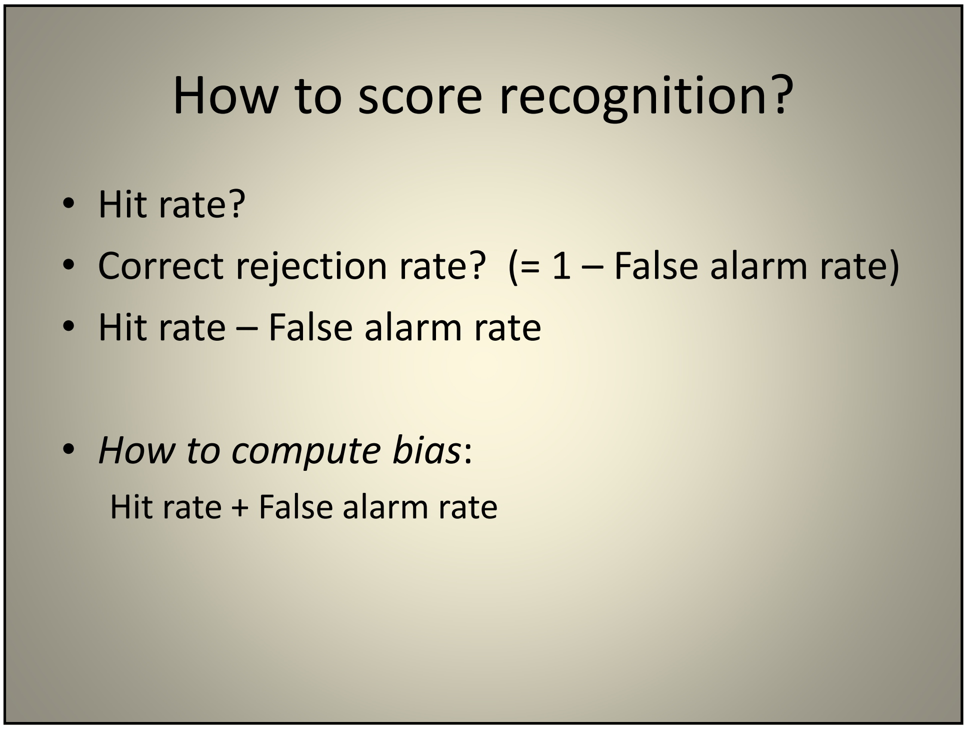
○ Strength of an UNSTUDIED item



Components of recognition decision

- Discriminability
  - – How well we can discern old from new items
- Bias
  - – How much evidence we demand before endorsement

- We don’t want a lower bias to look like better discriminability.

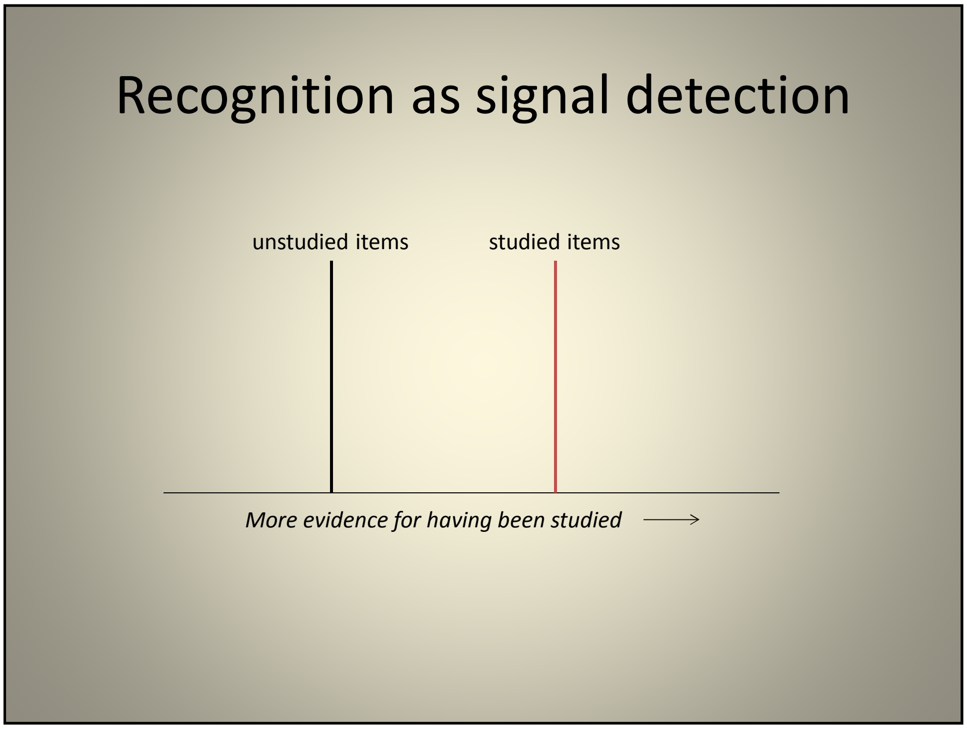


How to score recognition?

- Hit rate?
- Correct rejection rate? (= 1 – False alarm rate)
- Hit rate – False alarm rate

- *How to compute bias*:

  Hit rate + False alarm rate

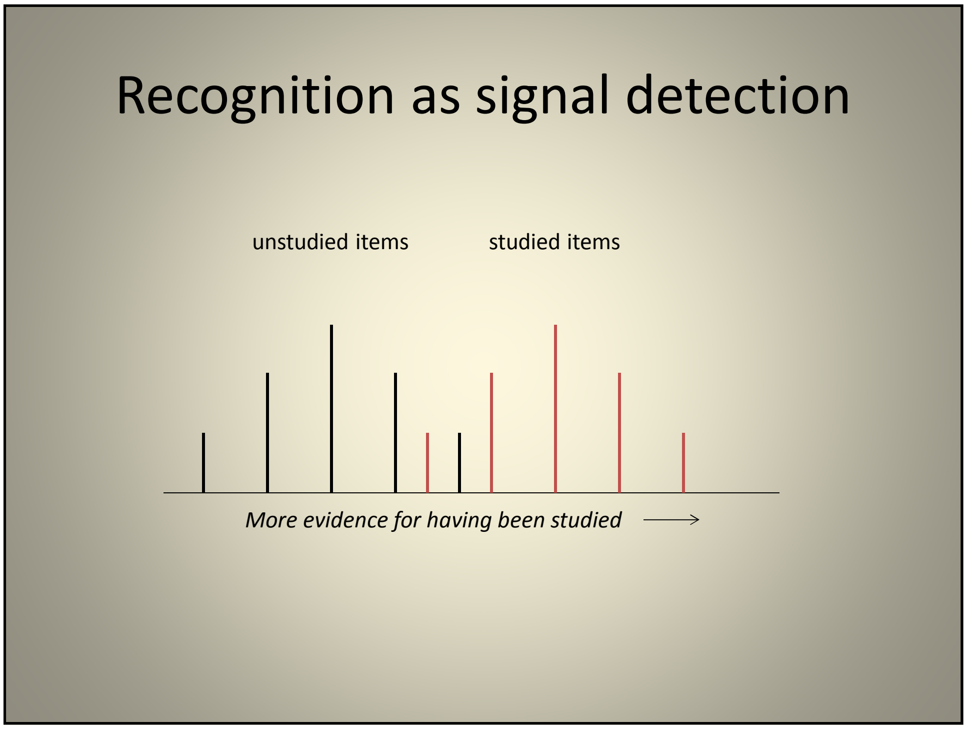


Recognition as signal detection

unstudied items

studied items

More evidence for having been studied ⟶



Recognition as signal detection

unstudied items

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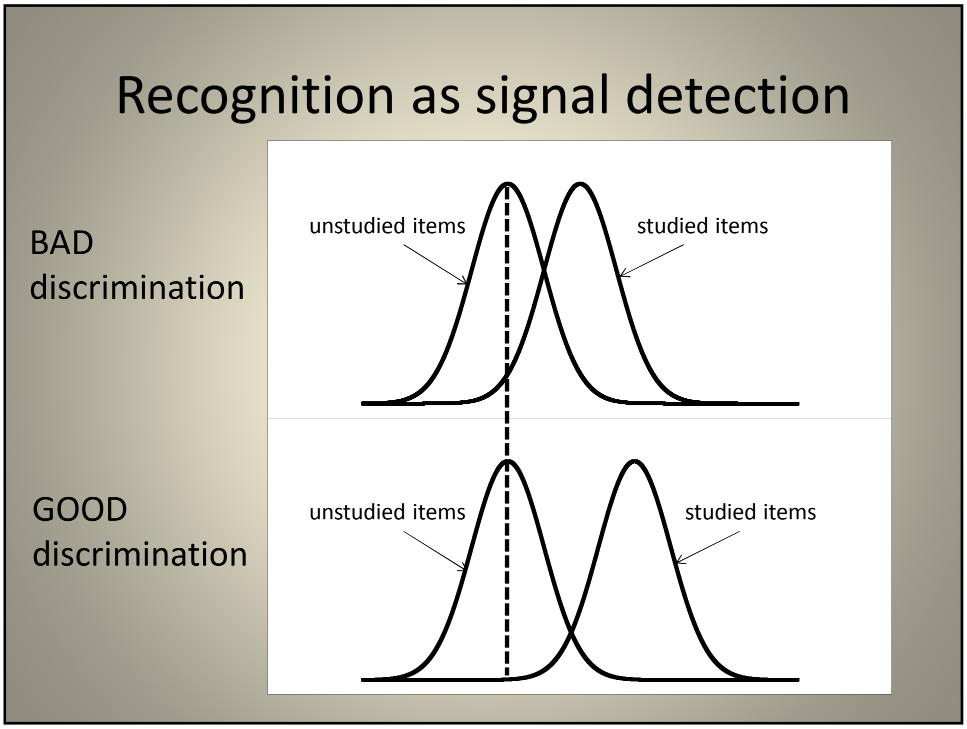
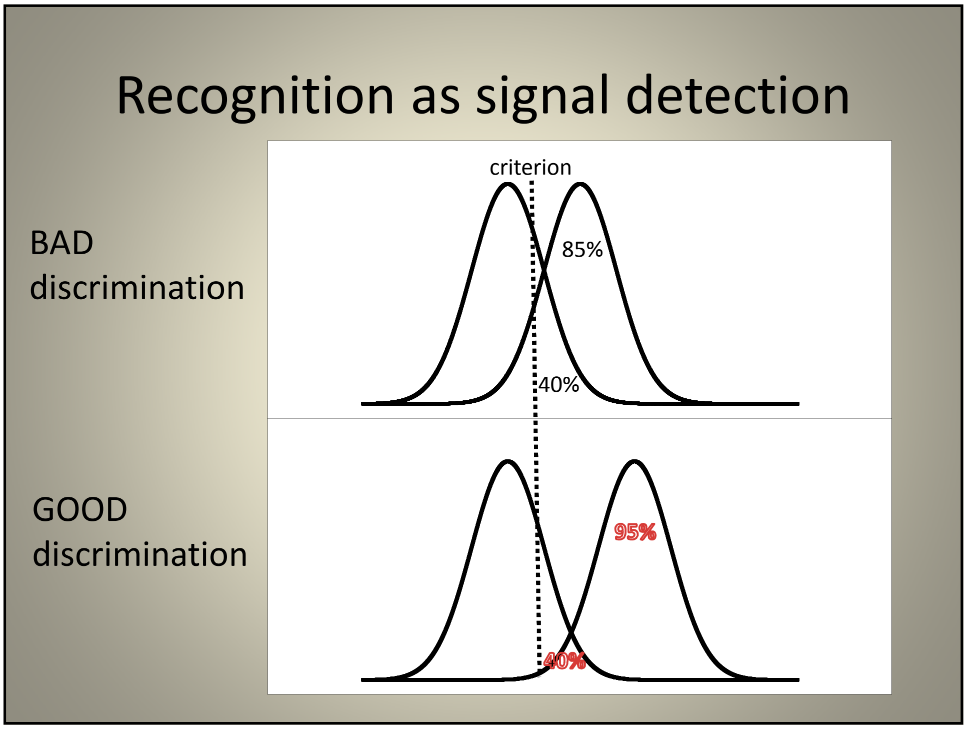


Recognition as signal detection

BAD
discrimination

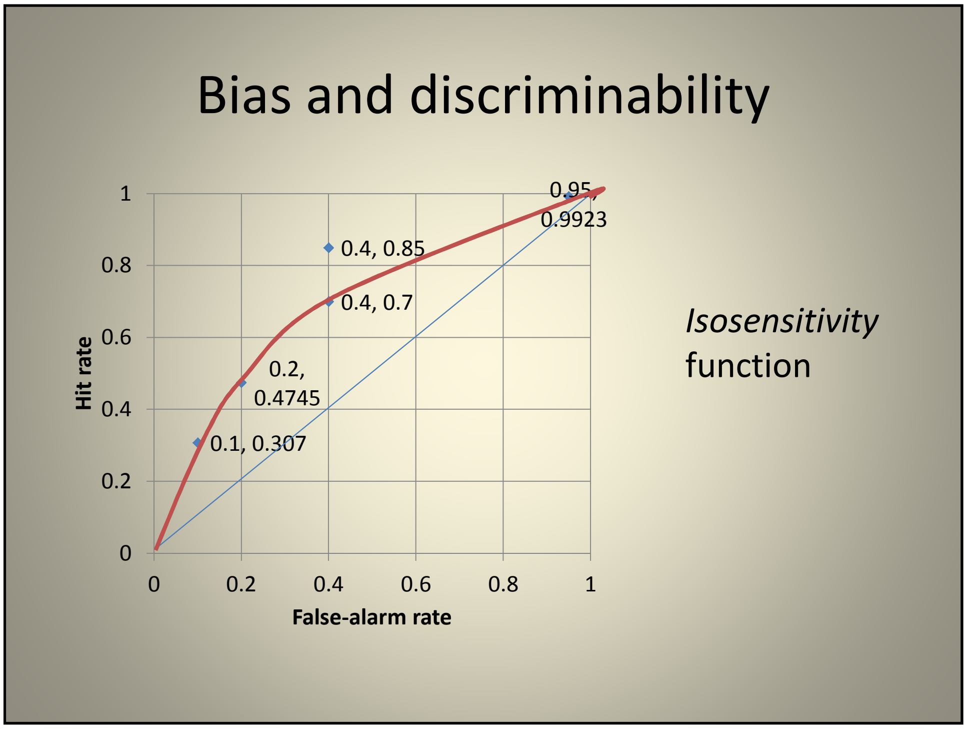
GOOD
discrimination



Recognition as signal detection

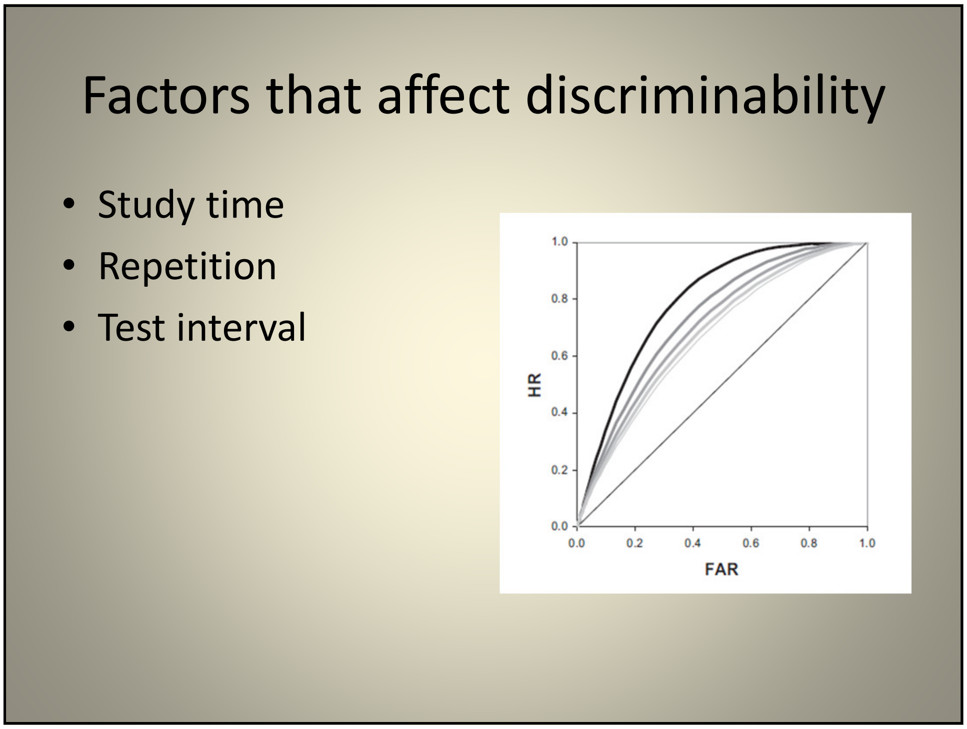
BAD
discrimination

GOOD
discrimination



Bias and discriminability

Isosensitivity function



Factors that affect discriminability

- Study time
- Repetition
- Test interval

Factors that affect bias

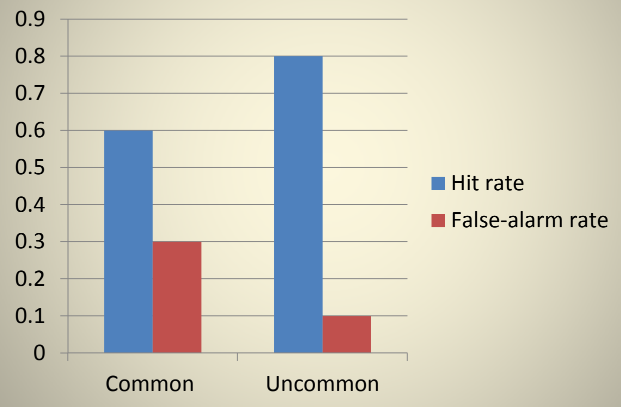
- Instructions
- Payoffs
- Stimulus memorability
- Quality of learning
- Difficulty of test

- Record
- Coffee-shop
- Leg
- Milkshake
- Square
- Flower
- Box
- Horse
- Printer
- Necklace
- Tongue
- Chisel
- Liquid
- Data Base
- Fungus
- Tapestry
- Shoes
- Sandpaper

Test

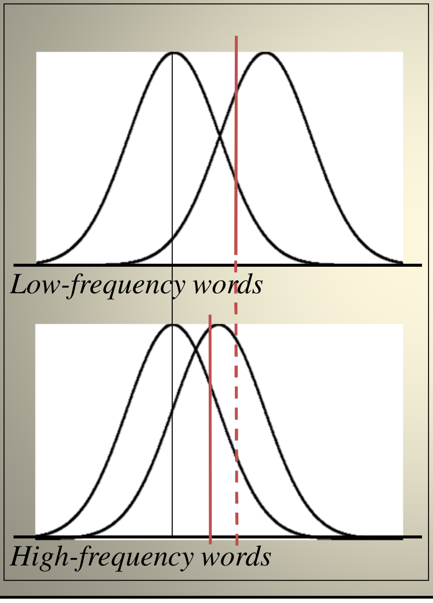
- Horse?
- Phone?
- Liquid?
- Bird?
- Horseradish?

Word-frequency effect in recognition



Mirror effect

Explanation of the effect



Discriminability is greater for uncommon words, but bias is higher.

Benjamin (2003)

Degree of learning and bias

Pure list:
word1 400msec
word2 400msec
word3 400msec
word4 400msec
...

Mixed list:
word1 400 msec
word2 2 sec
word3 400 msec
word4 2 sec
...

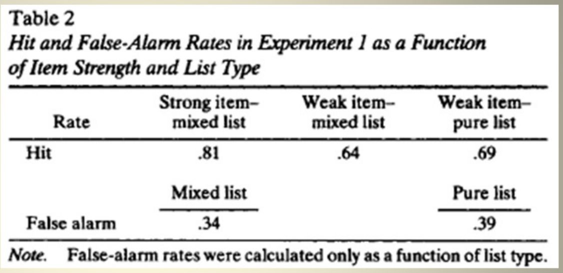


Table 2
Hit and False-Alarm Rates in Experiment 1 as a Function of Item Strength and List Type

Rate	Strong item–mixed list	Weak item–mixed list	Weak item–pure list
Hit	.81	.64	.69
	Mixed list		Pure list
False alarm	.34		.39

Note. False-alarm rates were calculated only as a function of list type.

Hirshman (1995)

Mustard
New Zealand Spinach
Orache
Pak choy
Paracress
Pea sprouts/leaves
Polk
Radicchio
Samphire
Seakale
Sierra Leone bologi
Soko
Sorrel
Spinach
Summer purslane
Tatsoi
Turnip greens
Watercress
Water spinach
Winter purslane
Yarrow

Amaranth
Arugula
Aubergene
Beet greens
Bitterleaf
Bok choy
Broccoli Rabe
Brussels sprout
Cabbage
Catsear
Celery
Celtuce
Carrot
Chard
Chaya
Chickweed
Chicory
Chinese cabbage
Chinese Mallow
Chrysanthemum leaves
Collard greens

Corn salad
Cress
Dandelion
Endive
Epazote
Fat hen
Fluted pumpkin
Garden Rocket
Golden samphire
Good King Henry
Greater Plantain
Kai-lan
Kale
Komatsuna
Kuka
Lagos bologi
Land cress
Lettuce
Lizard's tail
Melokhia
Mizuna greens

Test

- Swiss chard
- Fiddlehead
- Sea beet
- Ceylon spinach

- Hamburger
- Burrito
- Root beer
- Gummi bears

Factors that affect bias

- Instructions
- Payoffs
- Stimulus memorability
- Quality of learning
- Difficulty of test

Recency judgments

List 1:
HF word
LF word
LF word
HF word
LF word
HF word

List 2:
LF word
LF word
HF word
HF word
LF word
HF word

Test:
WORD
If you studied this word, which list was it from?

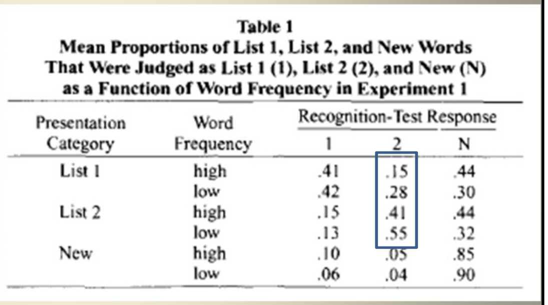


Table 1
Mean Proportions of List 1, List 2, and New Words That Were Judged as List 1 (1), List 2 (2), and New (N) as a Function of Word Frequency in Experiment 1

Presentation Category	Word Frequency	Recognition-Test Response 1	2	N
List 1	high	.41	.15	.44
	low	.42	.28	.30
List 2	high	.15	.41	.44
	low	.13	.55	.32
New	high	.10	.05	.85
	low	.06	.04	.90

Guttentag & Carroll (1997)

Time vs items as a basis for recency

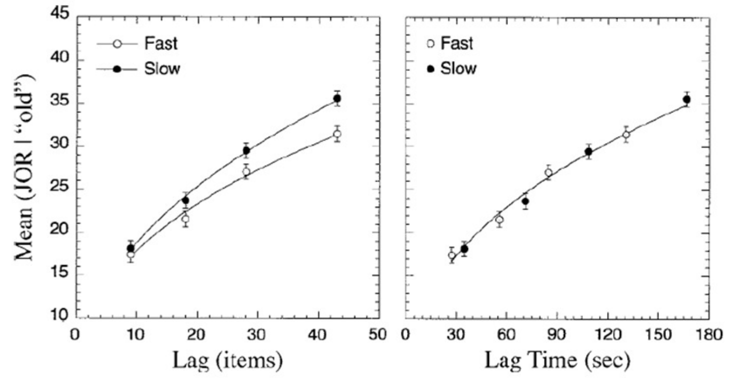
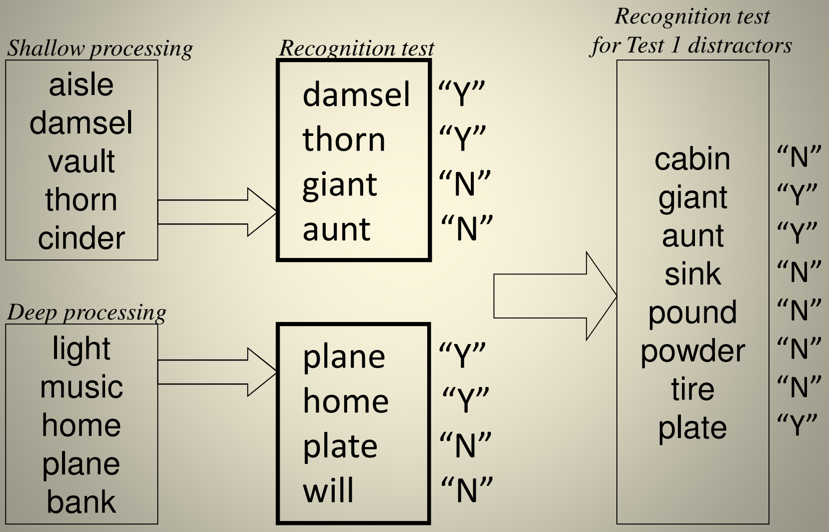


Figure 3. Mean JOR from Experiment 2, plotted as a function of test lag, measured in items (left panel) and time (right panel). Best-fitting power function in the right panel is JOR = $4.33t^{0.41}$. Error bars show *SE* on the basis of the subject × condition mean square (see Loftus & Masson, 1994).

Hintzman (2004)

Memory for distractors



Shallow processing

aisle
damsel
vault
thorn
cinder

Recognition test

damsel	"Y"
thorn	"Y"
giant	"N"
aunt	"N"

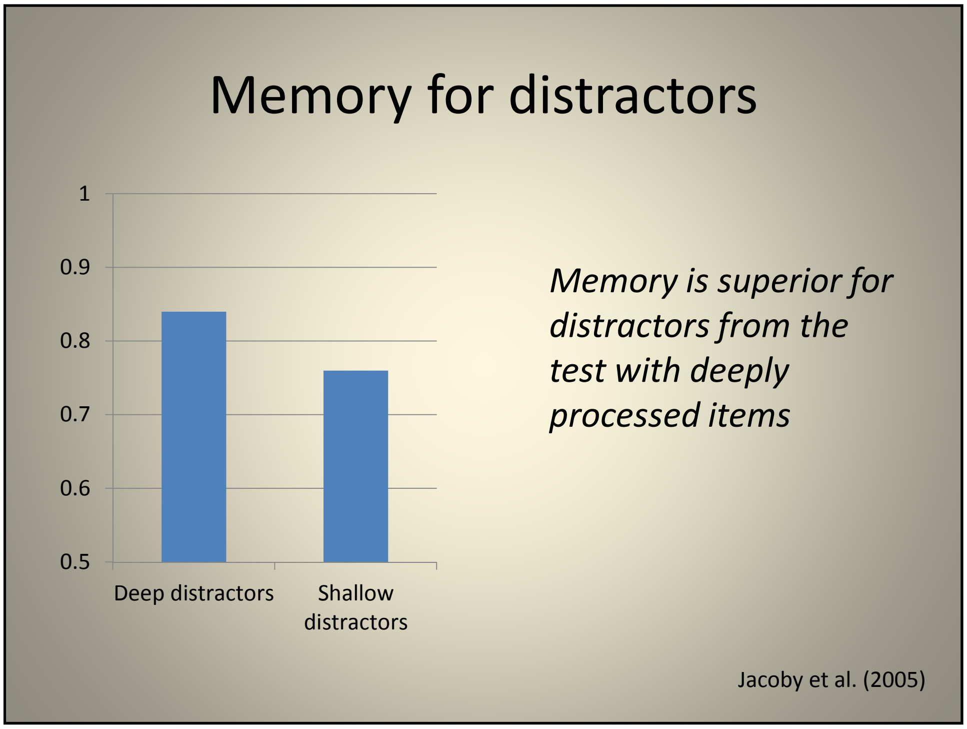
Deep processing

light
music
home
plane
bank

plane	"Y"
home	"Y"
plate	"N"
will	"N"

Recognition test for Test 1 distractors

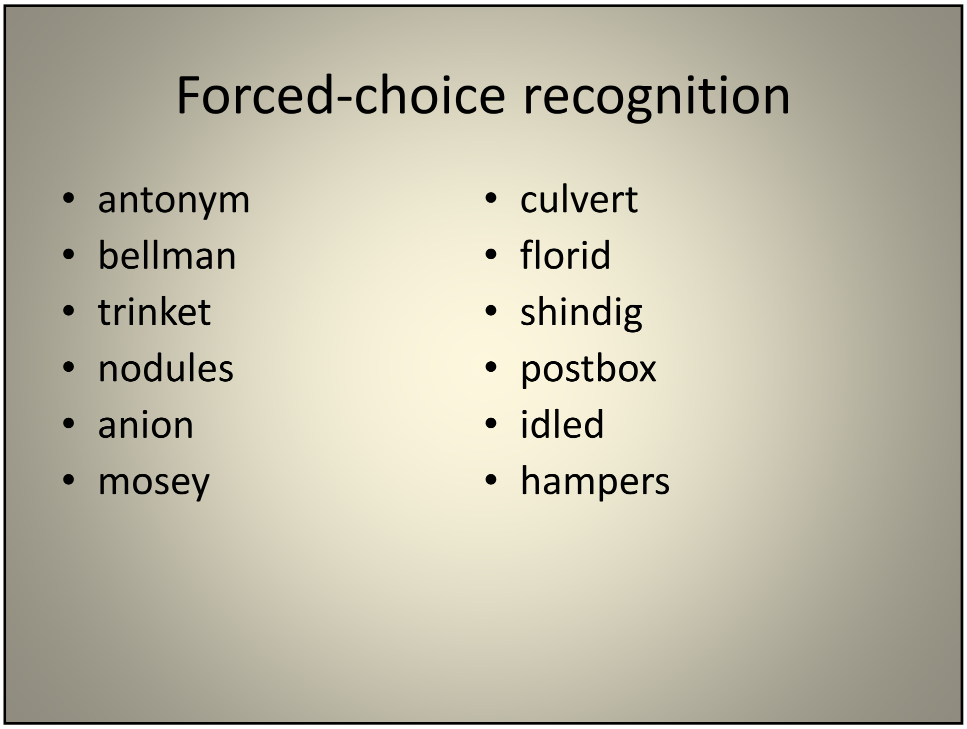
cabin	"N"
giant	"Y"
aunt	"Y"
sink	"N"
pound	"N"
powder	"N"
tire	"N"
plate	"Y"



Memory for distractors

Memory is superior for distractors from the test with deeply processed items

Jacoby et al. (2005)

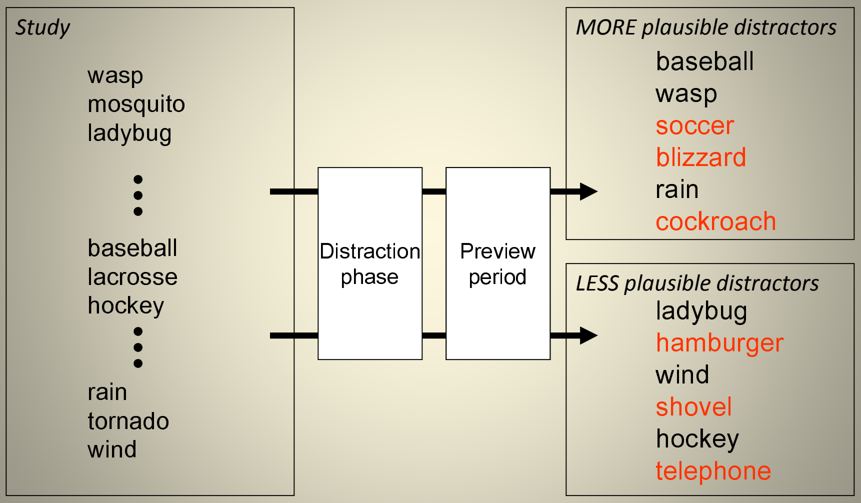


Forced-choice recognition

- antonym
- bellman
- trinket
- nodules
- anion
- mosey
- culvert
- florid
- shindig
- postbox
- idled
- hampers

Next class:
Forgetting

Variable distractor plausibility paradigm



Study

wasp
mosquito
ladybug
⋮
baseball
lacrosse
hockey
⋮
rain
tornado
wind

Distraction phase

Preview period

MORE plausible distractors

baseball
wasp
soccer
blizzard
rain
cockroach

LESS plausible distractors

ladybug
hamburger
wind
shovel
hockey
telephone

Recognition experiments

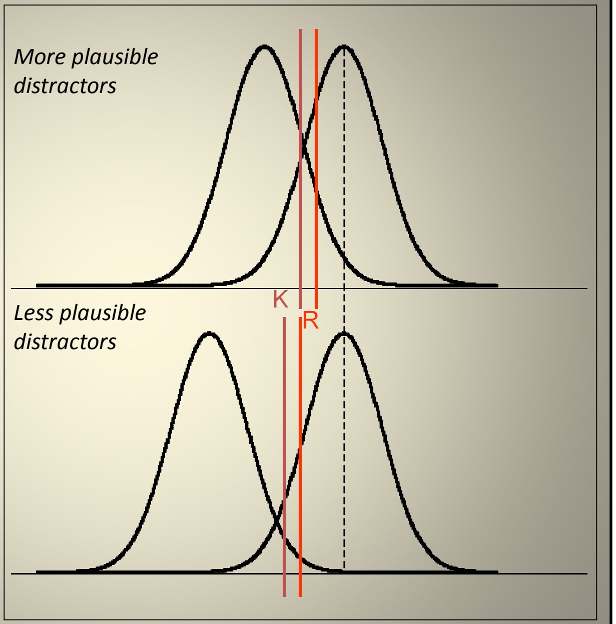
Bottle
Printer
Coat
Hallway
Turtle

→

Pocket
Printer
Swarm
Dishrag
Coat
Hallway
Bottle
Turtle
Number
Camera

HR	FAR	p("R")
.79	.18	.72

HR	FAR	p("R")
.89	.02	.80



Benjamin & Bawa (2004)